This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: D1003 – 21

Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics[1]

This standard is issued under the fixed designation D1003; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.
This test method replaces Method 3022 of Federal Test Method Standard 406.

1. Scope*

1.1 This test method covers the evaluation of specific light-transmitting and wide-angle-light-scattering properties of planar sections of materials such as essentially transparent plastic. Two procedures are provided for the measurement of luminous transmittance and haze. Procedure A uses a hazemeter as described in Section 5 and Procedure B uses a spectrophotometer as described in Section 8. Material having a haze value greater than 30 % is considered diffusing and should be tested in accordance with Practice E2387.

1.2 The values stated in SI units are to be regarded as standard.

NOTE 1—For greater discrimination among materials that scatter a high percent of light within a narrow forward angle, such as is the case with abraded transparent plastics, adjust the hazemeter and perform measurements in accordance with Test Method D1044.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 2—This test method is not equivalent to ISO 13468-1 and ISO/DIS 14782.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D618 Practice for Conditioning Plastics for Testing

D883 Terminology Relating to Plastics

D1044 Test Method for Resistance of Transparent Plastics to Surface Abrasion by the Taber Abraser

E259 Practice for Preparation of Pressed Powder White Reflectance Factor Transfer Standards for Hemispherical and Bi-Directional Geometries

E284 Terminology of Appearance

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E2387 Practice for Goniometric Optical Scatter Measurements

E2935 Practice for Conducting Equivalence Tests for Comparing Testing Processes

2.2 *ISO Standards:*[3]

ISO 13468-1 Plastics—Determination of the Total Luminous Transmittance of Transparent Materials

ISO/DIS 14782 Plastics—Determination of Haze of Transparent Materials

3. Terminology

3.1 *Definitions*—Terms applicable to this test method are defined in Terminologies D883 and E284.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *haze, n*—in transmission, the scattering of light by a specimen responsible for the reduction in contrast of objects viewed through it. The percent of transmitted light that is scattered so that its direction deviates more than a specified angle from the direction of the incident beam.

3.2.1.1 *Discussion*—In this test method, the specified angle is 0.044 rad (2.5°).

3.2.2 *luminous, adj*—weighted according to the spectral luminous efficiency function V(λ) of the CIE (1987).

3.2.3 *luminous transmittance, n*—the ratio of the luminous flux transmitted by a body to the flux incident upon it.

4. Significance and Use

4.1 Light that is scattered upon passing through a film or sheet of a material can produce a hazy or smoky field when

[1] This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.40 on Optical Properties.

Current edition approved May 1, 2021. Published June 2021. Originally approved in 1949. Last previous edition approved in 2013 as D1003 - 13. DOI: 10.1520/D1003-21.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

*A Summary of Changes section appears at the end of this standard

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